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confined, the rod afterwards remained magnetical. All this is nevertheless little more than conjecture, until confirmed by further experiments.

I am, dear sir, yours, &c.

DAVID RITTENHOUSE.

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### N<sup>o</sup> XVII.

*New Method of placing a Meridian Mark, in a Letter to the Rev. Dr. EWING, Provost of the University. By D. RITTENHOUSE, Esquire.*

DEAR SIR,

Read Nov.  
1785.

SOME time ago I mentioned to you a new invention I had for fixing a Meridian Mark for my Observatory. This I have since executed, and as it answers perfectly well, I shall give you a particular description of it.

When my observatory was first erected, I placed a meridian mark to the northward at the distance of about 1200 feet, my view to the south being too much confined by adjacent buildings, and that to the north was not distant enough to have the mark free from a sensible parallax. But last summer a new brick house was built directly north of the observatory, and much too nigh for distant vision with the transit instrument. Now though a fixed mark is not absolutely necessary where you have a good transit instrument, the position of which may be examined and accurately corrected, if necessary, every fair day, by the passage of the pole-star above and below the pole, it is nevertheless very convenient, saves much trouble, and may sometimes prevent mistakes. We have an instance in the observations of the Astronomer Royal at Greenwich. His

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mark being taken down at repairing the building to which it was secured, the transit instrument was accidentally thrown out of its true position, and the observations with it were continued for a considerable time before the error was detected. My meridian mark being thus rendered useless, I contrived several other methods of supplying its place, all of which were, on sufficient deliberation, rejected for the following.

I fastened the object glass of a thirty six feet telescope, firmly, to the wall which supports the transit instrument, opposite to and as near as convenient to the object glass of the transit, when brought to a horizontal situation. In the focus of the thirty six feet object glass I screwed fast a piece of brass to a block of marble, supported by a brick pillar built on a good foundation, for this purpose, in my garden. On this piece of brass are several black concentric circles; the rest of the plate is silvered. The diverging rays of light which proceed from every point in these circles, after passing through the thirty-six feet glass become parallel, and entering the transit instrument, an image of the plate and its circles is formed in the same place where the images of stars or the most distant objects are formed. The circles are therefore distinctly seen through the transit, and being placed in the same meridian with the centre of the thirty six feet glass, the innermost circle, about the size of a brevier o, serves for a meridian mark, to the centre whereof the cross hair of the transit may be nicely adjusted.

This mark is in several respects preferable to one placed in the common way. It is entirely free from parallax, which the other cannot be, unless placed at a very great distance, when glasses of great magnifying powers are used. It is not sensibly affected by the undulation of the air, which very often renders it impossible to set the transit accurately to a distant mark. And it can be illuminated at night without difficulty, should the suspicion of any  
accident

accident to the transit make it necessary. But it has likewise one disadvantage. Should the pillar in setting, carry the mark a little to the east or west, the error will be greater in proportion to its nearness.

I am, dear sir, your humble servant,

DAVID RITTENHOUSE.

P. S. The great improvement of object glasses by Dolland has enabled us to apply eye glasses of so short a focus, that it is difficult to find any substance proper for the cross hairs of fixed instruments. For some years past I have used a single filament of silk, without knowing that the same was made use of by the European astronomers, as I have lately found it is by Mr. Hirschell. But this substance, though far better than wires or hairs of any kind, is still much too coarse for some observations. A single filament of silk will totally obscure a small star, and that for several seconds of time, if the star be near the pole. I have lately with no small difficulty placed the thread of a spider in some of my instruments, it has a beautiful effect, it is not one tenth of the size of the thread of the silkworm, and is rounder and more evenly of a thickness. I have hitherto found no inconvenience from the use of it, and believe it will be lasting, it being more than four months since I first put it in my transit telescope, and it continues fully extended, and free from knots or particles of dust.

## N° XVIII.

*Account of a Worm in a Horse's Eye, by F. HOPKINSON, Esquire.*

Read Sep.  
26, 1783.

**H**AVING been myself a witness to the following curious fact, I thought it should

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